

Care Coordination for Children and Families with Lead Poisoning in Virginia



**Make Your Home
A Lead-Safe Zone**

Medical and Environmental Management
in the Public and Private Sector

**Virginia Department of Health
Division of Child and Adolescent Health
Lead Safe Virginia Program**

When it comes to lead poisoning,
prevention is protection



June 2001

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Medical and Environmental Management In the Public and Private Sector

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I Section I

- Purpose and Overview

Introduction

This reference manual contains protocols and materials to assist the provider in the prevention, diagnosis and treatment of childhood lead poisoning. As many as 25,000* children under age six in Virginia may be affected by elevated blood lead levels. Primary health care providers play an essential role in the widespread collaboration needed to eliminate the developmental delays and behavioral problems associated with this preventable disease.

Since 1991, when the Centers for Disease Control and Prevention (CDC) issued its recommendation to universally screen all children for blood lead levels, providers have expressed concern over resource allocation in areas where the prevalence of childhood lead poisoning is low. Universal screening was not widely embraced and many high-risk children were not tested. This new protocol incorporates the 1997 revised guidelines from CDC, which emphasizes targeted screening, with specific criteria for identifying high-risk children for blood lead testing. The objective is to increase targeted screening and follow-up for those children at high risk, while avoiding unnecessary blood lead testing.

Initial screening tests can be performed on blood collected by fingerstick or heel puncture (less than 12 months). Any elevated blood lead level above 10 $\mu\text{g}/\text{dL}$ must be confirmed by blood collected by venipuncture within 12 weeks. The proper techniques for obtaining blood samples via the capillary or venous method are discussed in detail in Section II. Guidelines for case management of a child with a blood lead level greater than 10 $\mu\text{g}/\text{dL}$ are discussed in Section III.

Located in the Appendix is the Denver II screening test. This is a widely used screening test to assess a young child's development and may be helpful in assessing and managing a child with an elevated blood lead level. It is composed of four categories: personal-social, fine-motor-adaptive, language and gross motor. While this test is an effective method of evaluating a child's rate of development, it is only as successful as the individual's expertise in administering it. Adherence to clear effective guidelines will be an important component in efforts to attain the national goal of eliminating childhood lead poisoning by the year 2010.

• ^E Estimate based on 1996 universal screening data from five rural and urban health districts in Virginia

I Section II

- National Health and Nutrition Examination Survey Results
- New Statistics from NHANES III, Phase 2

National Health and Nutrition Examination Survey Results

Statistics from data collected 1991-1994 from the National Health and Nutrition Examination Survey (NHANES) III, Phase 2

Summary

- Overall, 890,000 children (4.4%) aged 1 to 5 are lead poisoned (defined as blood lead levels equal to or above 10ug/dl).
- Rates are highest for children aged 1 to 2 (5.9%), compared to a rate of 3.5% for 3 to 5 year olds.
- For children aged 1 to 5, African American/ethnicity, low income, and living in pre-1946 housing were independent predictors of elevated blood lead levels.

Demographics

- Rates are higher among African American (11.2%) and Mexican-American children (4.0%) than among white children (2.3%).
- 8.0% of low-income children are lead poisoned compared with much lower rates for middle- and high- income children (1.9% and 1.0% respectively).
- Children living in urban areas had higher rates of lead poisoning than those in non-urban areas. However, the definition of urban areas used in the Phase II analysis was too broad to capture important distinctions like residence in “central city.” In addition, the definition is different than that used in Phase 1 of NHANES III, so this data is not comparable with that from the earlier phase.

Housing

- Children living in the oldest housing (pre-1946) had higher rates of lead poisoning (8.6%), compared to 4.6% of those living in 1946 – 1973 housing, and 1.6% for those in post 1973 housing.
- The elevated risk by age of housing persisted across race, income, and urban status. Thus, risk was higher among black children living in pre-1946 housing (21.9%) or 1946 – 1973 housing 13.7%), low income children living in pre-1946 housing (16.4%), and urban children in pre-1946 housing (11.5%).

Source: *Update: Blood Lead Levels – United States, 1991 – 1994*, Morbidity and Mortality Weekly Report, Vol. 46/No. 7, February 21, 1997.

New Statistics from NHANES III, Phase 2

The newest data represent a tremendous public health success story. Some will use this data to suggest that the problem is going away by itself and no further action is needed. That simply is not the case.

This remarkable drop in blood lead levels did not happen spontaneously – it's a direct result of regulatory actions in the 70's and 80's to limit lead in gasoline, paint, food cans, and other consumer products. If we want to finish the job, we must continue to take action. In fact, we believe that it would be irresponsible to stop now, when almost one million children are still poisoned.

The problem of childhood lead poisoning is still very real: 890,000 children (4.4%) aged 1 to 5 have too much lead in their blood. That's enough children to fill 37,000 classrooms or one child for every classroom in the country.

And, lead poisoning is still a striking example of environmental injustice, disproportionately affecting African American children. More than 1 in 5 African-American children living in older housing are lead poisoned. Children who are poor, urban, or live in older housing are also at increased risk for lead poisoning.

This data has significant implications for our ability to make progress on other important issues now facing our nation:

Lead and Education

Lead poisoning is an education issue. At the most common, low levels of exposure, lead poisoning impairs children's ability to learn and thrive, causing reductions in IQ and attention span, learning disabilities, and behavior problems, among other effects. Children with lead poisoning may not be able to enter school ready-to-learn. Prevention is a wiser investment than remedial efforts after the fact.

Lead and Urban Revitalization

Lead poisoning is an urban revitalization issue. Most children are poisoned right in their own homes by lead dust from old lead paint that is deteriorated or disturbed. The latest data confirms that urban areas with older housing which has been allowed to deteriorate are the principal current reservoirs of lead. Lead poisoning adds another important reason to the list for revitalizing our cities. And, since haphazard renovation or repainting work can actually increase lead hazards in older homes with lead paint, it is essential that all housing rehabilitation work incorporate lead safety. Home remodeling and repainting projects that disturb lead paint and stir up dust are a central reason that 1 in 5 poisoned children are not poor, urban or African-American.

New Statistics from NHANES III, Phase 2 cont.

Lead and Welfare Reform

Lead poisoning is a welfare reform issue. Lead poisoning provides an ironic combination of devastation and opportunity in distressed urban areas. On the one hand, it causes poor school performance, growth and behavior problems, and reduced earnings potential – effects with significant impact on the readiness of the work force. At the same time, lead hazard evaluation and control work is a potential source of community-based jobs. Lead hazard control work does not require high levels of formal education – it requires training in carpentry, home repair, and lead safe work-practices, job skills that are marketable in the broader field of home renovation. Lead poisoning prevention generates jobs, rebuilds communities, improves housing, and helps children and their families.

Lead and Health Care

Lead poisoning is a health care issue. Screening and treatment for lead poisoning consume considerable health care resources. With almost one million poisoned children, this is not a theoretical problem – it is a real epidemic. Treatment of lead poisoning is particularly labor-intensive and costly for health care providers because it requires environmental interventions, not just medical ones. And, despite more and more sophisticated efforts to target health care resources effectively, this drain will not end until we have made real progress on prevention. Prevention of lead poisoning is more cost-effective than treatment.

In the face of this new data, it is vital to maintain momentum on eradicating childhood lead poisoning by 2010. It would be a tragedy if the good news of real progress were to undermine national resolve to finish the job.

A red cross-shaped graphic with a black border, centered on the page. The cross has a horizontal bar and a vertical bar of equal width, with the intersection in the center. The text 'I Section III' is written in black, bold, italicized font across the center of the cross.

I Section III

- **Capillary Procedure Protocol**
- **Training Checklist for Capillary Lead Collection**
- **Phlebotomy Procedure Protocol**
- **Training Checklist for Venous Lead Collection**
- **Sample Collection for Lead Testing**

Capillary Puncture Protocol

Specimen Type

Capillary blood from fingerstick or heelstick

Principle

- A. Capillary blood collection is an important alternative to venipuncture in obtaining specimens, particularly in these situations:**
 - 1. pediatric patients less than a year old
 - 2. severely burned or scarred patients
 - 3. extremely obese patients
 - 4. patients with thrombotic tendencies
 - 5. patients with malignancies for whom venipuncture is reserved for therapeutic purposes
 - 6. geriatric patients, or other patients in whom superficial veins are either not accessible or are very fragile
 - 7. patients performing glucose with home monitoring devices
- B. It may be impossible to obtain a representative blood sample, especially by skin puncture, from patients with dehydration or poor peripheral circulation resulting from other causes, such as shock.**
- C. Reducing errors during blood collection will result in biologically representative specimens that are comparable from one institution to another.**
 - 1. Errors that can occur during the collection and handling of blood specimens include:
 - (a) misidentification
 - (b) use of incorrect anticoagulants
 - (c) formation of bruises
 - (d) food ingestion
 - (e) time of collection
 - 2. The effect of a professional capillary specimen collection provides:
 - (a) an adequate amount of blood for testing and subsequent diagnosis/treatment
 - (b) safety for the patient and staff

Standard Precautions

- A. Since medical history and examination cannot reliably identify all persons with HIV or other bloodborne pathogens, blood and body-fluid precautions should be consistently used for all individuals.**

Capillary Puncture Protocol cont.

- B. This approach, previously recommended by CDC, and referred to as “universal blood and body-fluid precautions” or “universal precautions,” shall be used in the care of all patients to prevent contact with blood or other potentially infectious materials.**
- C. According to the concept of *Universal Precautions*, all human blood and certain human body fluids are treated as if known to be infectious for HIV, Hepatitis B and C viruses and other bloodborne pathogens.**

Supplies and Equipment

- A. Chair (for patient to sit in while procedure is performed) should be designed so that it:**
 - 1. Does not roll
 - 2. Is at a height where the patient’s feet touch the ground (no barstools)
 - 3. Provides an angle where the patient’s arm can be supported
 - 4. Ask parent/guardian to assist in restraining the child
- B. Gloves**
 - 1. Latex, vinyl, or polyethylene
 - 2. Cotton liners are to be worn under latex or plastic gloves for employees who have developed a latex sensitivity

Note: Make sure that patient does not have a latex allergy.
- C. Safety Flow Sterile Lancets**
 - 1. Pink: 1.4mm depth/0.5mm width recommended for routine pediatric use (ages 1-3 years)
 - 2. Blue: 1.9mm depth/1.0mm width recommended for normal
 - 3. Yellow: 2.2mm-depth/1.0mm width recommended for infant heel sticks
- D. Capillary Collection Tubes (Microvettes/Microtainers)**
 - 1. Because of the many additives available, the collector should make sure that the proper tubes for the proper tests are collected.
 - 2. Tubes are universally color coded by manufacturers according to the additive, or lack of additive, in the tube.
 - (a) Red top: No additive and/or silicone coated to accelerate clotting.
 - (b) Green top: Contains heparin that enhances antithrombin III to prevent clotting.
 - (c) Lavender top: Contains EDTA that binds calcium to prevent clotting.
- E. Filter Paper**

Used for collecting specimens to detect Inborn Errors of Metabolism
- F. Antiseptics**

70% isopropyl alcohol preps

Capillary Puncture Protocol cont.

G. Gauze

Do not use cotton balls

H. Sharps disposal container

I. Bandages

1. Adhesive bandage
2. Gauze and sensitive skin tape

J. Ammonia Inhalants

K. Temperature Variables

Ice

Heel Warmer (or warm water and cloth)

Procedure

A. Identify the patient.

1. Review the chart to insure that all documents have the correct patient name and unique identifying number (chart # or patient id #). Any discrepancies should be brought to the attention of the clerk and corrected before proceeding.
2. If the patient does not speak the language of the phlebotomist, ask a relative, friend or clinician to identify the patient by name, address, and identification number or birth date.

B. Verify the patient has followed any diet restrictions by asking, “What did you have to eat or drink?”

C. Assemble supplies.

1. appropriate collection tubes
2. alcohol pads
3. gloves
4. a fluid impervious gown or apron and goggles if splashing of blood is anticipated
5. appropriate lancet based on the site selected and the amount of blood to be drawn

D. Reassure the patient.

1. Gain the patient’s confidence by assuring them that although the fingerstick will be a slight discomfort, it will be short of duration.
2. Tell the patient when the lancet is about to enter the skin so the patient will not be frightened.
3. Never tell a patient, “This won’t hurt.”

Capillary Puncture Protocol cont.

E. Positioning the patient.

1. Seat the patient comfortably in a chair with feet flat.
2. Position their arm on a firm surface.
3. Allow the hand to drop from the wrist to facilitate blood flow by gravity.
4. Patients with a history of fainting should be asked to lie down for specimen collection.
5. No food, chewing gum, bottles or thermometer should be in the patient's mouth while the specimen is being drawn.

F. Site selection

1. It is important to select the site carefully because successful blood flow should be obtained with one puncture.
2. Skin-puncture blood is a mixture of blood from arterioles, venules and capillaries and contains interstitial and intracellular fluids. Its composition is affected by:
 - (a) The blood flow to the skin at the time of specimen collection.
 - (b) The relative proportion of arterial and venous blood.
 - i) The proportion of arterial blood is greater than that of venous blood because the pressure in arterioles and the arterial limb of the capillaries is much greater than the pressure in the venules and the venous limb of the capillaries.
 - ii) The composition of venous blood in the skin. Venous blood in the skin more closely resembles arterial blood than venous blood in other parts of the body, especially when the puncture area has been warmed.
3. The skin-puncture site must be warm and not swollen (edematous), because accumulated fluid in the tissues will contaminate the blood specimen. (Non-intact skin or skin affected by dermatological disorders should not be used as skin puncture sites.)
4. Pediatric site selection
 - (a) Plantar surface of a big toe
 - (b) Lateral or medial plantar surface of an infant heel (the puncture will not be made through a previous puncture site or at the curvature of the heel)
 - (c) Excessive crying may adversely affect the concentration of some constituents, such as leukocyte count (a waiting period of thirty minutes should be observed between the time crying ceases and the skin puncture is performed)
 - (d) Skin punctures will not be performed on the central area of an infant's foot (using this area could result in injury to nerves, tendons and cartilage offering no advantage over puncturing the heel)
5. Adult site selection
 - (a) Palmer surface of the middle or ring finger of the non-dominant hand
 - (b) The puncture should be performed on the palmer surface of the distal phalanx and not at the side or tip of the finger. (the tissue on the side and tip of the finger is about half as thick as the tissue in the center of the finger)

Capillary Puncture Protocol cont.

- (c) The fifth finger should not be used for blood collection because the tissue is considerably thinner than the tissue of the thumb, index, middle and ring fingers
- 6. Special techniques
 - (a) Lower the extremity.
 - (b) Massage the arm from wrist to elbow.
 - (c) Apply a warm, damp cloth or heel warmer to the proposed site for 5 minutes (warming the site can increase blood flow seven-fold because it primarily increases the arterial blood flow, specimens from warmed sites are called “arterialized skin-puncture blood”).

G. Cleanse prospective puncture site.

1. The puncture site is cleansed to prevent microbiological contamination of either the patient or specimen.
2. Use a sterile alcohol pad.
3. The area must be thoroughly dried to prevent hemolysis of the specimen and to prevent the patient from experiencing a burning sensation when the venipuncture is performed.

H. Perform skin puncture.

1. Puncturing deeper than 2.4 mm may risk bone damage; therefore, lancets with a depth of greater than 2.2 mm are not used.
2. The heel or finger must be held firmly to prevent sudden movement.
3. The lancets used are automatic to produce a standardized puncture depth.
 - (a) Hold lancet on selected site lengthwise.
 - (b) Depress plunger.
 - (c) Immediately release plunger while holding lancet on site.
 - (d) Remove lancet. Discard in Sharps container.
 - Important: Keeping the plunger depressed while removing the lancet may cause cutting of the patient.**
 - (e) Wipe away the first drop of blood.

I. Fill the specimen container; always avoid air bubbles.

1. HemoCue
 - (a) HemoCue microcuvettes are filled by capillary action.
2. Capillary Collection Containers (Microvettes/Microtainers)
 - (a) These devices are used when larger volumes of blood are required and venipuncture is not an option.
 - (b) Order of draw
 - i) Lavender top
 - ii) Green top
 - iii) Red top
 - (c) Data on coagulation testing using skin puncture specimens is not available. Since tissue has clotting factors in high concentration, it is not permissible, at this time. To collect coagulation testing in this manner.

Capillary Puncture Protocol cont.

(d) Preparation

- i) Lift the cap attached to the sample container by a retaining loop, taking care not to lose the coated plastic beads.
- ii) Attach an open channel collector to the sample container. Maintain upright to prevent loss of beads.
- iii) **Wipe away one or two drops of blood that form after puncture.**
- iv) The open channel collector is applied to the remaining drops of blood that form until the desired amount is collected.
- v) Hold the container vertically to facilitate contact with the anticoagulant.
- vi) Avoid scooping the blood. Gently tap the tube to dislodge blood gathered inside the collector top.
- vii) Excessive pressure around the puncture site should be avoided to prevent hemolysis and premature coagulation of the sample.
- viii) After the desired amount of blood is collected, the channel collector is removed from the specimen container and

discarded.

ix)

Close the tube using the attached cap.

x) Mix vigorously, by inverting, 8-10 times.

xi) Label each specimen individually or

place in a larger

tube with an appropriate label. A label can be placed around a tube like a flag.

3. Filter Paper

- (a) Blood specimens for a variety of semi-quantitative tests may be collected on special kinds of filter paper.
- (b) For Neonatal Screening Programs, the filter paper circles must be filled completely and allowed to air dry before mailing to the lab performing the tests.

4. Microhematocrit tubes

- (a) Blood specimens for hematocrit determination are collected in heparinized microhematocrit tubes.
- (b) The tubes fill by capillary action and must be sealed with tube sealant before centrifuging.

J. Apply pressure to the site.

- 1. As soon as collection is completed, a piece of gauze should be applied to the site. Adult patients should continue pressure while specimens are being labeled. An adult should apply pressure when dealing with a pediatric patient.
- 2. Check the site for any continued bleeding. Apply an adhesive or gauze bandage over the puncture site. Tell the patient to leave on the bandage for at least 15 minutes.

Capillary Puncture Protocol cont.

3. In pediatric patients, try to enlist the parent or caretaker in applying pressure to the site until the bleeding stops.
 - (a) It is not advisable to apply adhesive bandages on children less than 2 years old.
 - (b) Adhesive bandages can cause irritation to the skin or become aspirated or ingested if put in the mouth. Please alert patients if adhesive bandages will be applied to the patient.

K. Remove gloves and dispose of gloves properly.

L. Wash hands thoroughly before going to the next patient.

1. Use soap and water from a nearby sink.
2. Use a commercial waterless antiseptic solution designed for between patient use.
3. If the outside of the tube or records is contaminated with blood, wipe the items with disinfectant before further handling or transfer.

Procedure Notes: Precautions

A. Avoiding Hematomas

1. Do not forcibly apply the lancet to the puncture site, nor press hard against the skin before engaging plunger. Release plunger before withdrawing lancet.
2. Do not milk the finger/puncture site or squeeze excessively, making the finger turn white.
3. Apply a small amount of pressure to the area with a gauze pad when bandaging the site.

B. Avoiding Hemolysis

1. Mix anticoagulated specimens thoroughly by inverting gently 5-10 times.
2. Do not draw blood from a hematoma or bruise.
3. Without touching, ascertain that the puncture site is dry before proceeding. Residual alcohol can cause hemolysis.

Procedure Notes: Special Collections

Timed Specimens

It is important that collection of specimens for timed tests be obtained at the precisely specified interval. Reference ranges are based on precise time intervals for tests like glucose.

Procedure Notes: Patient Problems

A. Syncope (fainting)

1. Lower patient head and arms, if they are sitting.
2. Loosen tight clothing.
3. Administer ammonia inhalant (patient may vomit).

4. Apply cold compresses to the forehead and the back of the neck.
5. Notify a physician, if the patient does not respond.

Capillary Puncture Protocol cont.

B. Nausea

1. Make the patient as comfortable as possible.
2. Instruct the patient to breathe deeply and slowly.
3. Apply cold compresses to the patient's forehead.

C. Vomiting

1. Give the patient an emesis basin or carton, and have tissues ready.
2. Give the patient water to rinse out his/her mouth.
3. Make a note on the chart. This is very important if the test is a glucose challenge.

D. Convulsions

1. Do not restrain the patient, but try to prevent him/her from being injured.
2. Consult the physician.

Limitation of Procedure

A. Capillary vs. Venous Blood

1. Some concentrations of chemical constituents vary between capillary and venous blood.
 - (a) Glucose: higher in capillary blood than in venous
 - (b) Potassium, total protein and calcium: lower in capillary blood than in venous.

References

National Committee for Clinical Laboratory Standards. *Procedures for the Collection of Diagnostic Blood Specimens by Skin Puncture-Third Edition*; Approved Standard. (H4-A3, 1991)

Becton Dickinson VACUTAINER Systems, Becton Dickinson and Company, Rutherford, New Jersey, *MICROTAINER Brand Safety Flow Lancets-Directions For Use*.

Sarstedt, West Germany. *Microvette CB 1000 S: Instructions for use for capillary blood collection*.

**Virginia Department of Health
Training Checksheet For Capillary Lead Collection**

NAME: _____ **DATE:** _____ **WORK LOCATION:** _____

TRAINER INITIALS	DATE	UPON COMPLETION OF TRAINING, YOU WILL BE ABLE TO:
		i. patient preparation a. ask parent to wash the child's hand with soap and water
		ii. specimen collection a. wash your hands, put on gloves, (use powerless gloves if necessary) b. all screening supplies should be kept in individual ziplock bags in a clean plastic box with a snap lid c. place supplies on a clean, white, lint-free paper towel -- this includes 2 alcohol pad, 3 gauze pad-one with soap, lancet placed on a tissue, microtainer & cap, band-aid d. isolate the child's thumb or finger from the rest of the digits e. clean with the soaped gauze pad; rinse twice with the alcohol pad, and dry with a clean gauze pad f. lance the lateral aspect of the thumb; wipe off first drop of blood g. collect the hanging drops of blood (this is easier if the thumb is in a downward position) h. fill the microtainer to the second line; do not overfill i. close the microtainer; agitate vigorously for 15 seconds to mix the blood with the anticoagulant j. label the specimen with the required information

		iii. instrument a. none
		iv. reagents a. microtainers with edta (lavender top) or lithium heparin (green top)
		v. test performance a. carefully follow fingerstick procedure b. carefully label microtainer, double check labeling or ask second person to check
		vi. quality control a. none
		vii. result validity a. follow guidelines for the detection and management of lead poisoning, Virginia Department of Health, 4/1/94 b. confirm elevated capillary blood lead levels of 15 mg/dl and above with venipuncture

I feel that I have been fully trained as to the procedure above and am ready to take responsibility for any work performed.

Trainee Signature _____

The signature of the technical consultant signifies that the employee has shown competency in the following areas as applicable: specimen processing, testing, maintenance, result reporting, duplicate testing and problem solving skills. The employee must demonstrate the skill for the trainer.

Technical Consultant Signature _____

Is remedial action needed? ___Yes ___No **If yes, please document all comments on the back.**

Specimen

- A. Venous blood**

Principle

- A. Reducing errors during blood collection will result in biologically representative specimens that can be used to diagnose disease.**
- B. Errors that can occur during the collection and handling of blood specimens include:**
 - 1. Misidentification
 - 2. Use of incorrect anticoagulants
 - 3. Formation of hematomas
 - 4. Hemoconcentration
 - 5. Food ingestion
 - 6. Time of collection
- C. The effect of a professional venipuncture provides:**
 - 1. An adequate amount of blood for testing and subsequent diagnosis/treatment
 - 2. Safety for the patient and staff

Standard Precautions

- A. Since medical history and examination cannot reliably identify all persons with HIV or other bloodborne pathogens, blood and body fluid precautions should be consistently used for all individuals.**
- B. This approach, previously recommended by CDC, and referred to as “universal blood and body-fluid precautions” or “universal precautions,” shall be used in the care of all patients to prevent contact with blood or other potentially infectious materials.**
- C. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, Hepatitis B and C viruses and other bloodborne pathogens.**
- D. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.**

Phlebotomy Protocol cont.

Supplies and Equipment

A. Chair (for patient to sit in during phlebotomy) should be designed so that it:

1. Does not roll
2. Is at a height where the patient's feet touch the ground
3. Provides an angle where the patient's arm can be supported
4. If the child requires a venipuncture, one adult should hold the child, while a second adult performs the procedure. A papoose board may also be used when appropriate.

B. Gloves

1. Latex, vinyl, non-latex, non-powdered or polyethylene
2. Cotton liners under latex or plastic gloves for employees who have developed a latex sensitivity

C. Lab Coats, aprons or other personal protective clothing

1. Disposable lab coats
2. Plastic apron
3. Yellow gown

D. Sterile Needles

1. 20-, 21-, 22-, and 23-gauge needles with a 1-1.5" length are the only ones recommended for routine venipuncture. 21-gauge is the most common.
2. The gauge number indicates the size of the needle. A large gauge number indicates a small-bore needle. The use of a small-bore needle may result in hemolysis of the blood.
3. Butterfly needles in 22- and 23-gauge with luer adapters are available for pediatric and hard-to-stick patients.
4. Syringes and needles come prepared in sterile packages. To use this method, the blood has to be transferred into the proper collection tubes.

E. Holders

1. Holders for evacuated tubes and needles should match tube diameters.
2. To prevent mishaps that can occur during collection, the needle and holder should be made by the same manufacturer due to the slight differences in the threading of each.

F. Evacuated Tubes

1. Evacuated tubes are manufactured to withdraw a predetermined volume of blood.
2. Because of the many additives available, the collector should make sure that the proper tubes for the proper tests are collected.
3. Tubes are universally color coded by manufacturers according to the additive, or lack of additive, in the tube.
 - (a) Red top: No additive or silicone coated to accelerate clotting.
 - (b) Red/black top: Contains inert barrier and silicone coated for serum separation.

Phlebotomy Protocol cont.

- (c) Gray top: Contains sodium fluoride and potassium oxalate that inhibits glycolysis and prevents clotting. Used for sample collection for glucose testing.
- (d) Green top: Contains heparin that enhances antithrombin III to prevent clotting. Used for sample collection for lead analysis.
- (e) Lavender top: Contains EDTA that binds calcium to prevent clotting. Used for sample collection for CBC, hemoglobin, and hematocrit.
- (f) Yellow top: Contains anticoagulant ACD. Used for sample collection for blood cultures.
- (g) Blue top: Contains Sodium citrate that binds calcium to prevent clotting. Used for sample collection for coagulation studies such as Prothrombin Time, APTT, and Fibrinogen.

G. Tourniquets, pediatric and adult

- 1. Pre-cut tourniquets made of soft, pliable rubber.
- 2. Blood pressure cuffs. The blood pressure is taken first and then maintained below the diastolic pressure of the patient, between 40-50 mm Hg.
- 3. Velcro-type tourniquets are usually made of a heavier rubber and are easy to apply and remove.

H. Antiseptics

- 1. 70% isopropyl alcohol preps
- 2. Povidone-iodine preps -- **for blood cultures only**

I. Gauze

Do not use cotton balls

J. Sharps disposal container

K. Band-Aids

L. Ammonia Inhalants

M. Temperature Variables

- 1. Ice
- 2. Heel Warmer (or warm water and cloth)

Procedure

A. Identify the patient.

- 1. Review the chart to insure that all documents have the correct patient name and unique identifying number (patient ID #). Any discrepancies should be brought to the attention of the clerk and corrected before proceeding.

Phlebotomy Protocol cont.

2. If the patient does not speak the language of the phlebotomist, ask a relative or friend to identify the patient by name, address and identification number or birth date.

B. Verify the patient has followed any diet restrictions by asking, “What did you have to eat or drink?”

C. Assemble supplies.

1. Appropriate collection tubes
2. Tourniquet
3. Alcohol pads
4. Gloves
5. Protective Clothing and goggles, if splashing of blood is anticipated
6. Appropriate needle based on the vein selected and the amount of blood to be drawn
7. Collection method
 - (a) Evacuated system: needle, holder and evacuated tube
 - (b) Syringe and needle: often used for patients whose veins easily collapse.
 - (c) Butterfly or winged infusion set

D. Reassure the patient.

1. Gain the patient’s confidence by assuring them that although the venipuncture will be slightly painful, it will be short of duration.
2. Tell the patient when the needle is about to enter the skin so the patient will not be frightened.
3. Never tell a patient “This won’t hurt.”

E. Position the patient.

1. Seat the patient comfortably in a chair.
2. Position their extended arm on a firm surface to form a straight line from the shoulder to the wrist. The arm should **not** be bent at the elbow.
3. Patients with a history of fainting should be asked to lie down for specimen collection.
4. No food, chewing gum or thermometer should be in the patient’s mouth while the specimen is being drawn.

F. Have the patient make a fist, without pumping.

1. Making a fist helps veins become more prominent and pulls the skin taut over the vein making a less stressful venipuncture.

G. Vein selection

1. It is important to select the vein site carefully because the veins provide a means for therapeutic transfusion and infusion.
2. Although the larger and fuller median cubital and cephalic veins are used most frequently, wrist and hand veins can be used for venipuncture.

Phlebotomy Protocol cont.

3. Do not select veins in the following regions:
 - (a) **Extensive scars:** i.e., healed burn areas.
 - (a) **Mastectomy:** because of potential harm to the patient due to lymphostasis, a physician should be consulted prior to drawing blood from the side on which a mastectomy was performed.
 - (b) **Hematoma:** may cause erroneous test results. If another site is not available, locate the part of the vein that is farthest away from the hematoma.
 - (c) **Intravenous therapy:** specimens should be collected from the opposite arm. If unable to do so, the fluid flow should be disconnected for 2 minutes and the blood drawn **below** the IV site.
 - (d) **Cannula, Fistula or Vascular Graft:** to be used only after consulting the attending physician.
4. Locating Veins
 - (a) Palpate and trace the path of the vein with the index finger.
 - (b) Thrombosed veins lack resilience, feel cord-like and roll easily.
 - (c) Arteries pulsate, are more elastic and have a thick wall.

Warning: If, during the procedure, arterial puncture is suspected, direct forceful pressure must be applied to the puncture site for a minimum of 5 minutes upon removal of the needle or longer until active bleeding has ceased. Notify the physician.

 - (d) Before attempting venipuncture in any of the difficult sites mentioned above, be sure that a more superficial vein cannot be located in the opposite arm or the underside of the forearm.
 - (e) Special techniques
 - i) Massage the arm from wrist to elbow.
 - ii) Tap firmly at the proposed vein site with index and second finger to dilate the vein.
 - iii) Apply a warm, damp cloth or heel warmer to the proposed site for 5 minutes.
 - iv) Lower the extremity.
 - (f) Be sure to loosen the tourniquet, if a vein is not located within 2 minutes, to prevent localized stasis and subsequent hemoconcentration.

H. Cleanse prospective venipuncture site.

1. The puncture site is cleansed to prevent microbiological contamination of either the patient or specimen
2. Use a sterile alcohol pad.
3. Cleanse the site with a circular motion from the center to the periphery
4. **Allow the area to dry** to prevent hemolysis of the specimen and to prevent the patient from experiencing a burning sensation when the venipuncture is performed.
5. If the vein must be touched again to draw blood during a difficult venipuncture, the site should be cleansed again.

Phlebotomy Protocol cont.

I. Apply the tourniquet.

1. The purpose of the tourniquet is to:
 - (a) Make the vein more prominent
 - (b) Make the vein easier to enter
 - (c) Draw the skin tighter over the vein
 - (d) Increase venous filling
2. Precautions when using a tourniquet:
 - (a) During venipuncture, **release after no more than one minute.**
 - i) Localized stasis with hemoconcentration and the formation of a hematoma can occur due to infiltration of blood into the surrounding tissue.
 - ii) The tourniquet may be allowed to be applied for up to **two minutes** when initially selecting a vein.
 - iii) If the patient has a skin problem, the tourniquet should be applied over the patient's sleeve to avoid pinching the skin. It would be appropriate to dedicate a tourniquet to that patient.
 - iv) Because tourniquets are potential germ carriers, they should be wiped with alcohol or replaced frequently.
3. Procedure for applying tourniquet
 - (a) Wrap the tourniquet around the arm three to four inches above venipuncture site.
 - (b) Tuck the end under the last round.
 - (c) If a Velcro tourniquet is used, adhere the tabs to each other.

J. Perform venipuncture.

1. Evacuated Tube System
 - (a) Thread the appropriate needle into the holder until it is secure, using the needle sheath as a wrench.
 - (b) Tap tubes to dislodge additive from the stopper and sides of the tube. Make sure that the top of the stopper is dry.
 - (c) Insert the blood collection tube into the holder and line it up with rubber covered valve.
 - (d) Angle the patient's arm downward to prevent reflux.
 - (e) Remove the cap of the needle. Visually inspect the needle for burrs, damage or irregularities.
 - (f) Grasp the patient's arm firmly. The phlebotomist's thumb should be used to draw the skin taut, anchoring the vein. The thumb should be one or two inches below the venipuncture site.
 - (g) With the bevel up, line up needle with the vein and proceed into the vein. A sensation of resistance will be followed by easy penetration as the vein is entered.
 - (h) Brace the needle end of the holder with an index finger. Grasp the collar of the needle holder and push the tube forward until the tube stopper is punctured. Maintain the tube below the site when the needle is in the vein.

Phlebotomy Protocol cont.

- (i) Do not change the position of the tube until it is removed from the holder. During the procedure, do not allow the contents of the tube to contact the stopper. Movement of the fluid back and forth in the tube can cause back flow of blood into the venous system and possible adverse patient reaction.
 - (j) Have the patient open their fist. Do not allow pumping of the hand.
 - (k) Keep constant, slight pressure towards the needle on the end of the tube. This prevents release of the shut-off valve and stopping blood flow. Do not vary pressure or reintroduce pressure after completing the draw.
 - (l) Fill the tube until the vacuum is exhausted and blood flow ceases. This will ensure that there is a correct ratio of anticoagulant to blood. It is normal for some anticoagulant-containing tubes not to fill completely.
 - (m) Remove the tube from the holder. Insert the next tube into the holder. Mix by inverting 5-10 times, previously filled tube containing anticoagulant (while this one is filling).
 - (n) **The “order of draw” should be:**
 - 1) Blood culture
 - 2) Non-additive (red top)
 - 3) Coagulation tube (blue top-Na citrate)
 - 4) Additive tube (green top-heparin)
 - 5) Additive tube(lavender top-EDTA)
 - 6) Additive tube (gray top-oxalate/fluoride)
 - (o) Non-additive tubes are drawn before additive tubes to avoid contamination of the non-additive tube. Cross-contamination between different additive tubes can also occur, making test results erroneous.
 - (p) **If a blue top tube, intended for coagulation testing, is the first or only tube to be drawn, a 5-ml red top tube for discarding should be filled first to eliminate possible thromboplastin contamination from the site of the venipuncture.**
 - (q) Loosen and remove the tourniquet as the last specimen is being drawn.
 - (r) A gauze pad should be placed lightly over the venipuncture site.
2. Needle and Syringe System
- (a) The needle and syringe come in a sterile package. If a different size needle is required, remove the undesirable needle from the syringe by unscrewing it from the base of the syringe and replacing it with the desired needle. Use a syringe that will obtain enough blood to fill the required tubes.
 - (b) Perform the phlebotomy as in steps 1. (d)-(g), above. There will be a natural flow of blood into the hub of the needle when the needle has entered the vein. Pull the plunger back and allow the syringe to fill until the required amount of blood is obtained.
 - (c) Remove the needle from the patient’s arm as outlined in step K.
 - (d) Rubber stoppers should not be removed from evacuated tubes. To transfer blood from the syringe to an evacuated tube, the tube is placed upright in a rack.

Phlebotomy Protocol cont.

- (e) **To avoid accidental needle stick, the tube must not be held with the hand.** Place tube in a rack and hold the rack. **The stopper is pierced with the needle and the tube is allowed to fill (without applying pressure to the plunger, causing hemolysis) until flow ceases.** This technique helps to maintain the correct ratio of blood to anticoagulant.
- (f) After the needle is removed by using the gripping opening of the Sharps disposal box, blood can be retrieved from the end of the syringe for any micro-collection of blood specimens, such as HemoCue hemoglobin or glucose. This may reduce the number of sticks required per patient.
- 3. **Winged Infusion Set (Butterfly)**
 - (a) Prepare patient as above. Connect the evacuated tube holder to the luer adapter end. After application of tourniquet and cleansing, grasp infusion set by pulling them together between the thumb and forefinger and guide the unsheathed needle into the vein.
 - (b) Fill the tubes using the evacuated tube procedure.
 - (c) After filling the last tube, withdraw the needle with the tube attached, otherwise it will drip immediately upon removal from the vein.

K. Remove the needle.

- 1. Remove the needle smoothly and in a continuous motion.
- 2. Take care to avoid scratching the patient's arm.
- 3. "Catch" the blood from the venipuncture site upon removal of the needle with firm pressure on the gauze. The patient should keep pressure on the venipuncture site while the phlebotomist is labeling their tubes and completing the paperwork. **Do not** have the patient bend his/her arm.
- 4. Place used needle/syringe directly into a Sharps container. **Do not re-sheath, bend, break, cut or remove needles from disposable syringes.**

L. Bandage the arm.

- 1. Check the site for any continued bleeding. Apply an adhesive or gauze bandage over the venipuncture site. Tell the patient to leave on the bandage for a least 15 minutes.
- 2. If the patient continues to bleed, the phlebotomist should:
 - (a) Apply direct and firm pressure with gauze until the bleeding stops.
 - (b) Apply a pressure bandage by folding 1-2 pieces of gauze and snugly securing a piece of tape of skin sensitive adhesive or a bandage.
 - (c) Any bleeding persisting beyond 5 minutes is considered excessive. The attending physician should be notified and pressure applied to the site as long as necessary to stop the bleeding.

M. Remove and properly dispose of gloves.

N. Wash hands thoroughly before going to the next patient.

- 1. Use soap and water from a nearby sink.
- 2. Use a commercial waterless antiseptic solution designed for between patient use.
- 3. If the outside of the tube or records is contaminated with blood, wipe the items with disinfectant before further handling or transfer.

Procedure Notes: Precautions

A. Avoiding Hematomas

1. Puncture only the uppermost wall of the vein.
2. Remove the tourniquet before removing the needle.
3. Use major superficial veins with sufficient diameter to sustain the bore of the needle.
4. Insure the needle fully penetrates the uppermost wall of the vein. Partial penetration or threading may allow blood to leak into the soft tissue surrounding the vein by way of the needle bevel.
5. Apply a small amount of pressure to the area with the gauze pad when bandaging the arm.

B. Avoiding Hemolysis

1. Mix anticoagulated specimens thoroughly by inverting gently 5-10 times.
2. Do not draw blood from a hematoma.
3. Do not pull forcibly when using a needle and syringe.
4. Do not use needles smaller than 23-gauge. Use larger needles on larger veins. Smaller needles take more time to fill tubes.
5. Make sure the needle is fitted securely on a syringe to avoid frothing.
6. Without touching, ascertain that the venipuncture site is dry.

Procedure Notes: Special Collections

A. Timed Specimens

1. It is important that collection of specimens for timed tests be obtained at the precisely specified interval.
2. Reference ranges are based on precise time intervals for tests like glucose.

B. Indwelling Lines

1. It is not recommended that blood be drawn from indwelling cardiovascular (arterial, central venous or umbilical) lines; however, occasionally it may be required to do so.
2. Because it is normal practice to flush lines with a solution of heparin to reduce thrombosis, lines must be cleared of heparin before blood specimens can be drawn for diagnostic testing.
 - (a) A 5-ml blank should be drawn and discarded.

C. Intravenous Fluids (I.V.)

1. All attempts should be made to draw blood from the opposite arm. Blood drawn above the IV will be diluted with fluid being administered to the patient.
2. Satisfactory samples may be drawn below the IV by following these procedures:
 - (a) The IV should be turned off for at least 2 minutes before venipuncture.

Phlebotomy Protocol cont.

- (b) Apply the tourniquet below the IV site. Trace the vein where the IV is located and select another vein to perform venipuncture.
- (c) Perform the venipuncture. Draw 5 ml of blood and discard before drawing test specimens.
- (d) Indicate on requisition or chart that blood was drawn from an arm with an IV.
- (e) Turn the IV back on.

Limitations: Patient Problems

A. Syncope (fainting)

- 1. Lower patient head and arms, if they are sitting.
- 2. Loosen tight clothing.
- 3. Administer ammonia inhalant (patient may vomit).
- 4. Apply cold compresses to the forehead and the back of the neck.
- 5. Notify a physician, if the patient does not respond.

B. Nausea

- 1. Make the patient as comfortable as possible.
- 2. Instruct the patient to breathe deeply and slowly.
- 3. Apply cold compresses to the patient's forehead.

C. Vomiting

- 1. Give the patient an emesis basin or carton, and have tissues ready.
- 2. Give the patient water to rinse out his/her mouth.
- 3. Make a note on the chart. This is very important if the test is a glucose challenge.

D. Convulsions

- 1. Do not restrain the patient, but try to prevent him/her from being injured.
- 2. Consult the physician.

References

National Committee for Clinical Laboratory Standards. Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture-Third Edition; Approved Standard. (H3-A3, 1991)

National Committee for Clinical Laboratory Standards. Evacuated Tubes for Blood Specimen Collection-Third Edition; Approved Standard. (H1-A3, 1991)

Virginia Department of Health

Training Checksheet For Venous Lead Collection

NAME: _____ DATE: _____ WORK LOCATION: _____

Trainer Initials	Date	Upon Completion You Will Be Able To:
		<u>I. Patient Preparation</u> a. Greet patient and briefly explain what you are going to do. b. Place patient in a comfortable position, providing necessary support (adult holds patient in chair). c. Prepare venipuncture equipment. The lavender top tube is used for lead collection. d. Observe Universal Precautions (Gloves and any other PPE necessary). Gloves should be powder free.
		<u>II. Specimen Collection</u> a. Wash hands, put on gloves, rinse gloves with water and wipe with a white paper towel. b. All collection supplies should be kept in individual ziplock bags in a clean plastic box with a lid. c. Select appropriate site for venipuncture and apply tourniquet just above the site. d. Select vein and cleanse site with 70% alcohol or other approved disinfectant. e. Perform the venipuncture while making sure the bevel of the needle remains up. The vein can be anchored using the thumb and forefinger of the hand not performing the venipuncture. f. Collect a full lavender top tube. Remember to invert several times to mix blood and anticoagulant. g. Release the tourniquet, place a sterile gauze or cotton ball over the site (do not apply pressure). Gently remove the needle. Dispose of the needle in a Sharps container as soon as possible. h. Immediately apply pressure to the puncture site. Instruct the patient to apply pressure to the puncture site for 2-3 minutes. g. Make sure the site has stopped bleeding before the patient leaves. Apply band-aid if necessary. h. Label the tube with the patient name, date and any other appropriate information.
		<u>III. Instrument</u> None
		<u>IV. Reagents</u> None

		<u>V. Test Performance</u> a. If a hematoma is noted at the venipuncture site during the procedure, immediately discontinue the procedure and apply pressure to the site for several minutes. b. If you are unable to obtain blood, discontinue the procedure and inform the patient you would like to try again. If the patient is agreeable, inspect the other arm or another area for a suitable vein, or call for assistance. c. The tourniquet should not be left on the arm for more than 2-3 minutes. d. Be sure the lavender top tube is full since poorly filled tubes can cause erroneous results.
		<u>VI. Quality Control</u> No quality control is performed on this procedure.
		<u>VII. Result Validity</u> a. It is IMPERATIVE that the specimen is labeled with the patient name! Unlabeled specimens can not be used! b. Dispose of all contaminated materials following Universal Precautions. c. Follow the current Virginia Department of Health guidelines for Detection and Management of Lead Poisoning.

I have been verbally trained on this procedure and feel that I am adequately prepared to perform the process.

Trainee Signature _____

The signature of the technical consultant signifies that the employee has shown competency in the following areas as applicable: specimen processing, testing, maintenance, result reporting, duplicate testing and problem solving skills. The employee must demonstrate the skill for the trainer.

Technical Consultant Signature _____

Is additional instruction needed? ____ Yes ____ No If yes, please document comments on the back.

Sample Collection for Lead Testing

Principle

The collection of the sample for lead testing is extremely important. Environmental lead contamination can cause inaccurate test results. Trace levels of lead can be found on work surfaces, the hands of the collector and the hands of the child.

Specimen

- A. Capillary blood from heelstick (infant) or fingerstick collected into a lavender or green capillary collection device (microtainer or microcuvette). Capillary samples are collected for screening only.
- B. Venous blood from venipuncture collected into a lavender, green, or trace metal vacutainer tube. Venous samples are used for confirmation samples and may be used for screening.
- C. Collect specimens according to established protocols.

Supplies and Equipment

To avoid background contamination, keep all screening supplies in a clean plastic container with a snap lid. Keep your liquid soap in this container. Always wash your hands before you begin to assemble your supplies. Place items in ziplock bags before you put them in the plastic container.

- 1. Alcohol pads
- 2. Microtainers with caps (and scoops or capillary tubes, if applicable); vacutainer tubes
- 3. Gauze pads
- 4. Lancets; vacutainer needles and holders
- 5. Tissues
- 6. Band-Aids
- 7. Tourniquet

Procedure

- A. Wash your hands**
- B. Assemble necessary supplies, based on mode of collection, from the plastic container and place on a clean, white, lint-free paper towel. (Recycled or colored paper towels can contain trace levels of lead.) Always squeeze items for the ziplock bags into the field.**

Sample Collection for Lead Testing cont.

1. Capillary puncture:
 - (a) 2 alcohol pads
 - (b) 3 gauze pads (soap on one)
 - (c) lancet placed on a tissue
 - (d) microtainer and cap (usually lavender)
 - (e) Band-Aid
2. Venipuncture
 - (a) 1 alcohol prep
 - (b) 3 gauze pads (one with soap)
 - (c) vacutainer, needle, and holder
 - (d) Band-Aid

C. Put on required personal protective equipment, as defined in your OSHA Bloodborne Pathogen Policy. Always wash your hands with soap and water before putting gloves on. Use powder free gloves if possible. If using gloves with powder, put on two pair of gloves and rinse outer pair with tap water. Dry with white paper towel. DO NOT use brown or recycled towels which may contain lead.

D. Capillary Puncture

1. Have parent wash the child's hand with soap and water, dry with white paper towel.
2. Isolate the finger from the rest of the fingers and cleanse with the soapy gauze pad;
wipe with 2 alcohol preps and dry with gauze pad.
3. Lance the lateral aspect of the finger according to acceptable technique. Wipe away the first drop of blood.
4. Collect the pendant drops of blood into the microtainer (microvette). Remember to keep the finger in a downward position and avoid squeezing the tip of the finger (milking), or scraping blood from the finger.
5. Fill the microtainer between the first and second lines. Do not overfill! There is only enough anticoagulant for blood to the second line. Gently mix the blood in the microtainer periodically during the collection process to insure that it does not clot.
6. Ask the parent to apply pressure to the site with a clean gauze pad.
7. Cap the microtainer tube, removing the scoop or capillary tube (if detachable). **Shake the tube vigorously for 15 seconds** to mix the blood with anticoagulant.
8. Immediately label the tube with the child's name and other necessary information.
9. Discard of materials in compliance with Regulated Medical Waste Policy.

E. Venipuncture Collection

1. Select site and wash with soapy gauze.
2. Wipe with alcohol preps and dry with clean gauze.
3. Follow established venipuncture procedure, collecting sample into vacutainer tube.
4. Once collection is complete, request the parent apply pressure to gauze pad over venipuncture site.

Sample Collection for Lead Testing cont.

5. Vigorously shake the tube, and immediately label with child's name and other necessary information.
6. Discard of materials in compliance with Regulated Medical Waste Policy.

Interpretation of Result

A. CDC Recommendations for diagnostic and follow-up testing for children with elevated Blood Lead Levels

If result of screening test (ug/dL) is:	Perform diagnostic test on venous blood within:
10 – 19	3 months
20 – 44	1 month—1 week*
45 – 59	48 hours
60 – 69	24 hours
70 or higher	Immediately as an emergency lab test

*The higher the screening Blood Lead Level, the more urgent the need for a diagnostic test.

Reference

Virginia Department of Health Child Health Record

Procedure for Screening and Follow-up

All children 6 to 72 months are screened by the lead risk questionnaire at each WIC (Woman, Infant and Children Food Supplement Program) visit and each WBC (Well Baby Clinic) visit.

- All children are tested at 12 to 24 months with a capillary (fingerstick) blood lead level.
- Children deemed “high risk” (as determined by answering ‘yes’ to one or more questions on the risk questionnaire) are tested at 6 months with a capillary blood lead level.
- If a capillary blood test result is 10ug/dL or greater, a venous blood sample is obtained.
- If a venous lead test result is 10-19ug/dL, the child is retested every three months. Once 2 consecutive measurements are less than 10ug/dL, testing frequency is decreased to once a year or at the discretion of the provider.
- If a venous lead test is 10ug/dL or greater the child is opened to case management.

Risk Assessment and Screening Questionnaire

- Test blood lead levels of ALL children at ages 1 and 2. Testing is performed at 6 months if ‘yes’ to one or more of the following questions. Test children 3-5 years of age who have not previously been tested, and if ‘yes’ to one or more of the following:

Is the child:

1. Eligible for or receiving Medicaid, VACMSIP or WIC benefits?
2. Living in a ZIP code determined to be high risk based on age of housing and other factors? (See attached)
3. Living in or regularly visiting a house or day care center built before 1950?
4. Living in or regularly visiting a house built before 1978 with peeling or chipping paint or recent (within the last 6 months), ongoing or planned renovation?
5. Living with or regularly visiting a sibling, housemate or playmate with lead poisoning?
6. Living with an adult whose job or hobby involves exposure to lead?
7. Living near an active lead smelter, battery recycling plant, or other industry likely to release lead?

- Take careful history regarding possible lead exposure at each routine visit.
- Provide nutrition and risk reduction educational materials for parents.
- Screening may be performed by venipuncture or capillary, although **venipuncture is preferred**. The use of hand-held testing machines must be approved through the Lead-Safe Virginia Program at 804-225-4455.

Confirmation of Elevated Blood Lead Levels

Confirmation of Screening Results

If result of capillary screening test (ug/dL) is:	(Suggested time period) Perform diagnostic test on venous blood within:
10-19	3 months
20-44	1 month - 1 week (The higher the test result, the sooner the diagnostic test should be performed.)
45-59	48 hours
60-69	24 hours
>70	Immediately as an emergency lab test

- Confirm all elevated non-venous blood lead levels >10 ug/dL.
- Venipuncture is preferred. A second capillary is allowable if performed within 12 weeks.
- Virginia regulations require reporting of all test results >**10 ug/dL** on the **Epi I** form (pg.); however, **ALL** blood lead test results are requested to be reported by laboratories to the VDH Office of Epidemiology so that prevalence can be estimated.

Case Management

Venous blood lead level 10-19ug/dL: retest every 3 to 4 months

- A. Case Management Assessment completed in the office, by phone or during a home visit.**
***See appendix.**
- B. Caretaker is taught:**
 - 1. Main sources of lead:
 - a. paint in homes built before 1978
 - b. dust in homes built before 1978 – crumbling paint becomes part of dust
 - c. soil – lead in patient has accumulated in soil over the years
 - d. repairing or remodeling old homes
 - e. adults who are exposed to lead at job or hobby can bring lead to children on their clothing
 - 2. Possible outcome of lead poisoning:
 - a. decreased intelligence
 - b. hyperactivity
 - c. decreased hearing
 - d. decreased growth
 - 3. Methods to reduce blood lead levels:
 - a. preventive housekeeping measures: wet wipe or mop walls, window sills, and floors at least once a week TSP
 - b. wash child's hands and face frequently especially before meals and snacks, before naps and bedtime, after playing outside, keep nails short and clean
 - c. encourage child to put nothing in mouth but food
 - d. wash toys and pacifiers everyday
 - e. keep child away from peeling or chipping paint
 - f. keep child away from places where lead paint is being removed
 - g. give child regular healthy meals with food high in iron and calcium (lean meats, fortified cereals, beans, greens, eggs, milk and cheese)
 - h. give healthy snacks – fruit and yogurt rather than candy, soda or chips
 - i. do not store food in open cans
 - j. use dishes purchased in stores in this country (avoid yard sales and gift shops for dishes)
 - k. if any adults with whom the child comes in contact have jobs or hobbies that expose them to lead, they should change clothes and shoes and shower (these work clothes are to be washed separately)
 - l. if water pipes in home are old – flush for 1 to 2 minutes before using and use bottled water for formula. Always use cold water for food preparation.
- C. Treat with iron supplement or at the discretion of the provider **see appendix**
- D. Environmental investigation initiated with two consecutive 15ug/dl or greater or single 20 ug/dl or higher blood lead level.**

Case Management cont.

I. Venous blood lead level 20ug/dl or greater – steps under a, b, c, d above and:

- E. Home visit for case management assessment (see above) by lead nurse**
- F. Medical evaluation (referred to private doctor or health department clinic)**
- G. Refer for child development evaluation**

II. Venous blood lead 30ug/dl or greater – steps under a, b, c, d, e, f, g and:

- H. Patient is scheduled for medical evaluation at a physician staffed clinic**

Present protocols include – oral chelation medication – flat plate x-ray for abdomen with radiological interpretation if ordered per physician and blood chemistries. Follow-up treatment is based on blood studies.

Case Management cont.

Step-by-step guidelines to manage a child with an elevated lead level based on the specific level.

BLOOD LEAD LEVEL (ug/dL)	ACTION (Case manager assures coordinated action and follow-up)
<10	<ul style="list-style-type: none"> Reassess or rescreen in 1 year.
10-14	<ul style="list-style-type: none"> *Provide nutritional and risk reduction education. Provide follow-up testing - venous, within 3 months. Refer for WIC and social services, if needed.
15-19	<ul style="list-style-type: none"> Obtain medical history. *Provide nutritional and risk reduction education. Provide follow-up testing - venous, within 3 months. Refer for WIC and social services, if needed. Refer to health department for coordinated case management and environmental exposure source identification if 2 venous blood lead test results are in this range at least 3 months apart.
20-44	<ul style="list-style-type: none"> Begin clinical management (complete medical evaluation, including developmental assessment). *Provide nutritional and risk reduction education. For medical treatment information, contact the local health department or regional treatment center listed below. Medical treatment (chelation) may be recommended at 35 ug/dL on a case-by-case basis. Refer to local health department for coordinated case management and environmental exposure source identification. Provide follow-up testing - venous, every 2 months or more often as medically necessary. Refer for WIC and social services, if needed.
45-69	<ul style="list-style-type: none"> Within 48 hours, begin clinical management including medical treatment, complete medical evaluation, and developmental assessment. For medical treatment information, contact the local health department or regional treatment center listed below. *Provide nutritional and risk reduction education. Refer to local health department for coordinated case management and environmental exposure source identification. Provide follow-up testing - venous, once a month or more often as medically necessary. Refer for WIC and social services, if needed.
70 and above	<ul style="list-style-type: none"> Hospitalize child and begin medical treatment immediately. For medical treatment information, contact the local health department or regional treatment center listed below. Begin clinical management (complete medical evaluation, including developmental assessment). *Provide nutritional and risk reduction education. Refer to local health department for coordinated case management and environmental exposure source identification. Provide follow-up testing - venous, once a month or more often as medically necessary. Refer for WIC and social services, if needed.

*See appendix.

Protocol For Closing Case(s)

Routine Cases

A. Two consecutive venous blood lead levels below 10ug/dL.

OR

B. Reached age 6 years and venous blood lead levels have not varied over 5 to 10ug/dL in one year.

Letter should be sent to caretaker explaining that their child's lead levels have reached acceptable levels and the lead poisoning program will no longer follow them. The letter should state that it is recommended that the caretaker make an appointment for yearly lead testing and that "lead-safe" housing is the optimum living condition. A contact name and number should be provided.

Non-Compliant Cases

A. Failure of three consecutive lead clinic or venipuncture appointments

1. Two letters sent to caretaker by health department with no response.
2. Three home visits (includes not at home) made by outreach worker, social worker or case manager with no response to messages.

CLOSURE OF ANY CASE WITH VENOUS BLOOD LEAD

LEVELS OF 30ug/dL OR HIGHER MUST BE DISCUSSED WITH AND SIGNED OFF BY NURSING SUPERVISOR.

B. More intense follow-up efforts are encouraged as time and staff permits.

C. All closures of lead cases are to be reviewed by the public health nurse senior that works with lead poisoning issues.

Chelation Treatment Recommendations

Instructions for patients taking chemet

Your child is being given a drug to reduce the lead level in his/her body. Please read the following instructions carefully, and be sure that any other caretaker also reads them. If you have any questions, please call (local health department number and your Senior Lead Public Health Nurse and Outreach Worker(s) names).

1. Your child will be taking _____ capsule(s) three (3) times a day at _____, _____, and _____ for five (5) days. After that he/she will take _____ capsule(s) at breakfast and bedtime for fourteen (14) days.
2. Capsules may be opened and emptied into small amounts of food or juice. Soft, good tasting foods (ice cream, pudding, Jell-O, applesauce, etc) help disguise the taste and smell of the medication.
3. Be sure that the child is getting plenty of water and juice.
4. The most common side-reactions are upset stomach of any kind and rash. Notify us of any suspected reaction, and do not give any more medication until problem is cleared. If you have an emergency, go to (Local Hospital) emergency room and call the health department the next morning.
5. You must return to the Health Department on the following dates for the following reasons:

Return ____/____/____ for: -- CBC, Platelet Count (~ Day 7 Chemet)

-- Liver Panel

Return ____/____/____ for: --CBC, Platelet Count (~ Day 14 Chemet)

--Liver Panel

Return ____/____/____ for: --CBC, Platelet Count (~ Day 20-27 Chemet)

--Liver Panel

Chelation Treatment Recommendations cont.

Lead protocol using Chemet

Childhood lead poisoning: indications for treatment at physician's discretion

1. Venous lead (recent-within 2 weeks) ≥ 45
2. Venous lead > 25 on 2 occasions within a month

Treatment

1. Take a Complete History
 - a. *Dietary*
 - b. *Pica*
 - c. *Environmental (housing, play areas, etc.)*
2. Physical Exam
3. Pretreatment Procedures
 - a. *Radiology (if after treatment venous blood leads are still elevated or multiple Rx's)*
 10. i) KUB of abdomen to rule out paint chips (if present, then needs clean
 11. out, pediatric fleets and/or golytly)
 12. ii) wrist films for lead lines (this may not be necessary).
 - b. *Laboratory*
 13. i) CBC with diff. & Plts. (Before beginning Tx & weekly while on Chemet)
 14. ii) Chem 20 (Before beginning Tx & weekly while on Chemet)
4. Treatment with Chemet (100mg capsules)
 - a. Dosing the Medication

Pounds	Kilograms (KG)	Dose (mg)	Number of Capsules
18 – 35	8 -15	100	1 (#43)
36 – 55	16 - 23	200	2 (#86)
56 – 75	24 - 34	300	3 (#129)
76 – 100	35 - 44	400	4 (#172)
> 100	> 45	500	5 (#215)

- b. Dosage Schedule
 15. i) Days 1-5, Q 8 hours
 - ii) Days 6-19, Q 12 hours

5. Follow-up

- a. Repeat venous blood lead immediately post therapy, blood lead and labs 2 weeks after therapy has been completed.
- b. Make sure that the house has been inspected and that the lead has been removed or child removed. If the blood lead level is high (rebound will occur), treat again after 2 weeks (note** need a 4 week window between treatments)

Food And Good Nutrition

Lead poisoning can cause learning and behavior problems in children. High levels of lead can cause serious damage and disability. Take measures to reduce your child's exposure to lead. If you live in a home built before 1978 wet cleaning and dust control will help keep the lead levels down. You can also lower your child's risk by preparing food safely and making good food choices. Good nutrition will help strengthen your child's resistance to lead poisoning!

Safe Food Preparation

Lead can get into food. Sometimes lead can be found in tap water. Some cans use to have lead in the seams. Certain plates, cups or bowls can contain lead. Lead dust on floors and surfaces can contaminate food.

- Let tap water run for 2 minutes before collecting water for consumption such as for use in infant formula.
- Do not use hot water to prepare formulas or other foods.
- Never heat food in cans.
- Never store food in opened cans.
- Do not use dishes or pottery from other countries if you think they may contain lead.
- Wash your hands before fixing foods to make sure there is no lead dust on your fingers.
- Wash your child's hands before he/she eats.
- Wash off all bottles, pacifiers or foods that fall on the floor before giving them back to your child.

Good Food Choices

The food that your child eats can make a difference in how much lead gets into your child's blood. Choose foods that help protect your child from lead poisoning. Serve foods high in iron, calcium, and vitamin C. Limit foods high in fat and oil that can make it easier for the body to absorb lead.

Choose Foods High In Iron

- Chicken, turkey, lean beef, liver
- Cooked dried beans or peas, baked beans, chili, limas, butter beans, black-eyed peas
- Iron fortified cereals
- Baked potato with skin
- Greens and spinach
- Raisins, nuts and seeds — sunflower or pumpkin seed

Other Ideas for Iron Sources

- Add a food or drink with vitamin C to each meal.
- If your doctor prescribes iron medicine for your child, mix it with a little bit of orange juice or any juice with vitamin C.
- Cook food in iron pots and pans. This will add a lot of iron to your child's diet.
- Serve healthy snacks - 5 to 6 small meals are better than 3 big meals. A child with an empty stomach will take in more lead.
- Do not serve hot tea or iced tea during a meal. Tea keeps the body from taking in iron.

Choose Foods High In Calcium

[Skim or low-fat milk products are best.]

- Milk, cheese, yogurt
- Greens and kale
- Ice milk
- Hot chocolate or pudding

Choose Foods High in Vitamin C

- Oranges, grapefruit, tangerines, strawberries, cantaloupe
- Juices – orange, grapefruit, lemonade
- Tomatoes
- Bell peppers
- Potatoes & sweet potatoes baked in their skins
- Greens and kale

Limit Foods High in Fats and Oils

- Butter
- Oil
- Lard
- Bacon
- Sausage
- French fries

Iron and Nutrition

Instruction sheet for Iron Supplement

Child's Name: _____

1. Give your child the recommended amount of iron 1 hour after meals with juice or water.

2. DO NOT GIVE IRON SUPPLEMENT WITH MILK.

3. While your child is taking iron, stools may appear darker. If this happens, this is normal, so do not worry.

4. In addition to iron supplements serve foods rich in iron.

5. Instructions for giving your child the correct amount of iron are CIRCLED below:

Weight of child (lbs.)	Dosage	Number of days per bottle
5	Seek advice from health care provider	Will vary
6-7	0.3 ml twice (2) a day (after 2 meals)	~75
8-10	0.3 ml three (3) times a day (after 3 meals)	~55
11-14	0.6 ml twice (2) a day (after 2 meals)	~40
15-16	0.6 ml after breakfast 0.3 ml after lunch 0.6 ml after dinner	~30
17-21	0.6 ml three (3) times a day (after meals)	~20
22-28	1.2 ml twice (2) a day	~20
29 or larger	Calculate dose accordingly (6mg/1 kg)	Will vary

6. Return as scheduled in three (3) months for re-check.

Regional Treatment Centers

Children's Hospital of the King's Daughters (Norfolk)	(757) 668-7179
Medical College of Virginia (Richmond)	(804) 828-7010
University of Virginia (Charlottesville)	(800) 451-1428
Children's National Medical Center (DC)	(202) 884-5000

NOTE: Local knowledge can override these guidelines as determined by collaboration between the local health director and the private physician.

NOTE: For questions related to your local area, refer to your local health department.

Developed by the Virginia Department of Health Statewide Screening Plan Work Group.
Funded by the Centers for Disease Control and Prevention and the Virginia Department of Health.

Cleaning Tips

Lead paint in homes today is at least 25 years old. It has been the law since 1979 that lead cannot be used in household paint. This lead paint is now very dry and tiny pieces crumble constantly becoming part of the household dust. Lead dust is also tracked inside from the soil in the yard. A home can look clean and still have lead in it. Every time children put their fingers or toys in their mouths they are eating lead. They also breathe in lead dust.

There are many things a parent or caregiver can do to decrease the amount of lead a child is exposed to:

- Keep the home as dust-free as possible using tri-sodium phosphate (TSP) and water. Wet mop this floors and wipe furniture with this solution. Tri-sodium phosphate can be purchased in most hardware stores. (Be sure to follow the precautions on the box: wear gloves and keep TSP out of reach of children). You can also use an automatic dishwasher detergent such as Cascade.
- It is very important to clean in a manner that does not allow dust to blow into the air. Always work with a damp sponge or cloth. Rinse sponges under running water to clean. Dispose of cloths used to clean windowsills or loose paint.
- Lead painted windows are very dangerous. The opening and closing of windows causes lead dust and chips to fall into the windowsills and wells. The following safety steps are necessary and should be used whenever possible.
 1. Keep children away from windows.
 2. Wet mop and wet dust at least twice a week. Wipe windowsills and walls regularly.
 3. If possible, open windows from the top. Keeping the bottom closed helps prevent children from being exposed to lead particles that collect in the sills – and help prevent children from falling out of the window.
 4. If there is loose paint on the windowsills or wells, cover it with contact paper. DO NOT SAND OR SCRAPE.
 5. Keep windows closed on windy days so dust does not blow into the house.

HIGH-RISK VIRGINIA ZIP CODES *

22002	22713	22969	23315	23827	24016	24285	24464
22046	22716	22971	23324	23828	24066	24289	24465
22134	22718	22972	23336	23829	24067	24292	24467
22201	22719	22980	23350	23830	24072	24293	24468
22203	22726	23009	23354	23837	24085	24301	24471
22204	22727	23021	23356	23839	24086	24312	24472
22205	22729	23022	23357	23840	24088	24315	24473
22206	22732	23023	23359	23842	24089	24316	24476
22207	22733	23024	23395	23844	24090	24318	24479
22211	22734	23025	23399	23846	24091	24319	24483
22301	22735	23027	23404	23847	24093	24322	24484
22302	22736	23038	23405	23850	24094	24323	24485
22305	22740	23045	23407	23851	24102	24325	24486
22307	22746	23047	23409	23866	24105	24326	24487
22314	22747	23066	23410	23867	24112	24330	24501
22401	22749	23069	23417	23868	24124	24333	24503
22427	22810	23079	23418	23872	24127	24340	24504
22435	22811	23083	23420	23874	24128	24343	24517
22448	22812	23084	23421	23881	24131	24347	24526
22454	22815	23108	23426	23888	24134	24350	24528
22473	22820	23109	23432	23890	24138	24352	24531
22480	22821	23110	23440	23894	24139	24366	24534
22488	22824	23125	23442	23901	24141	24368	24539
22503	22832	23130	23503	23915	24147	24370	24540
22504	22834	23139	23504	23920	24149	24375	24541
22509	22835	23149	23505	23922	24150	24378	24553
22514	22841	23153	23507	23923	24185	24380	24555
22539	22842	23156	23508	23924	24201	24382	24569
22560	22843	23176	23509	23930	24216	24401	24577
22579	22844	23177	23510	23934	24219	24413	24578
22601	22846	23180	23511	23936	24221	24416	24579
22611	22847	23181	23517	23937	24226	24422	24590
22620	22849	23185	23521	23938	24230	24426	24592
22639	22851	23219	23523	23942	24236	24430	24594
22642	22853	23220	23604	23944	24237	24432	24597
22643	22901	23221	23607	23952	24245	24433	24598
22644	22903	23222	23651	23958	24250	24435	24602
22645	22931	23223	23661	23962	24251	24437	24605
22649	22935	23226	23665	23964	24258	24439	24613
22650	22937	23227	23701	23968	24265	24442	24622
22654	22938	23229	23702	23970	24270	24435	24639
22657	22939	23230	23704	23974	24272	24445	24649
22660	22943	23231	23707	24011	24273	24450	24651
22663	22947	23301	23803	24013	24277	24458	
22664	22959	23302	23821	24014	24282	24459	
22709	22964	23308	23824	24015	24283	24460	

* Areas with these ZIP codes have > 27% of housing built before 1950 or an increased prevalence of children with elevated blood lead levels per available data. ZIP codes are from the 2000 Census. View <http://www.vahealth.org/leadsafe/> for updates and information on Childhood Lead Poisoning in Virginia and access to publications available to medical professionals, parents, and others. Toll free phone (877) 668-7987 or (804) 225-4455.

Virginia Department of Health, Revised August 2001

Medicaid Reimbursement Guidelines for Environmental Investigation of Lead Hazards

Health districts may obtain Medicaid reimbursement for environmental investigation to identify the source or sources of lead exposure for a Medicaid eligible child with an elevated blood lead. For reimbursement, the child must have a venous blood lead at or greater than 20 micrograms per deciliter, or two consecutive venous tests at or above 15 micrograms per deciliter. **A special code has been developed by DMAS for billing purposes, Z9993.** The reimbursement rate is \$150 per household investigation for lead poisoning hazards. Only one billing is authorized per household, regardless of the number of visits

The recommended procedure for the environmental investigation is outlined in Chapter 16 of the *1995 HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*, which contains a comprehensive questionnaire that can be used to document the investigation. The questionnaire includes considerations for where the child spends extended periods of time, painted surfaces, soil, drinking water, occupations and hobbies of family members, child behavior risks, cosmetics, home remedies, imported ceramic dishes, imported canned foods, items the child has access to such as non-glossy imported vinyl miniblinds, fishing sinkers, old batteries, putty, shellacs, oil, pesticides, dyes, etc. This portion of the investigation does not require a certified lead-based paint risk assessor.

Copies of Chapter 16 can be obtained at no cost by calling the **VDH Lead-Safe Virginia Program at (804) 225-4455**. The entire HUD Guidelines are available for \$45 from HUD User at 1-800-245-2691.

For homes and day care centers built before 1978, lead-based paint hazards may need to be evaluated. The Virginia Lead-Based Paint Activities Regulations (administered by the VA Dept of Professional and Occupational Regulation, phone: 804-367-8595) require this portion of the investigation to be conducted by a certified lead-based paint inspector or risk assessor. A list of certified individuals is available by calling the Lead-Safe Virginia Program.

Each health district is encouraged to have at least one certified lead-based paint risk assessor on staff. Reimbursement for training and certification is also available through the Lead-Safe Virginia Program. For additional information visit the Lead-Safe Virginia Program at the Virginia Department of Health at www.vahealth.org/leadsafe.

CASE MANAGEMENT ASSESSMENT

Check: _____ Primary Address _____ Related Date: _____
 Child's Name: _____ DOB: _____
 Parent's Name: _____ Test date: _____ BLL: _____
 Address: _____
 Telephone: Home: _____ Work: _____
 No. of Children in Home < 6 yrs.: _____ Child length of Residence: ____
 If < 6 months, Prior Address(es): _____
 Private Medical Doctor: _____
 Insurance: Kind and Policy # _____
 What other homes does your child visit? (include: home of relatives, friends, neighbors, babysitters)
 Person Visited: _____ Address: _____
 Phone #: _____ How often? _____
 Person Visited: _____ Address: _____
 Phone #: _____ How often? _____

Symptoms:

_____ None	_____ Constipation	_____ Hyperactivity
_____ Nausea	_____ Anorexia	_____ Muscular
_____ Vomiting	_____ Lethargy	_____ Irritability
_____ Diarrhea	_____ Weakness	_____ Convulsions
_____ Anemia	_____ Headaches	_____ Restlessness
_____ Unusual Behavior	_____ Other Specify: _____	

Date Symptoms First Noticed: _____
 Is Child taking iron now? _____ Yes _____ No
 Has he/she taken iron in the past? _____ Yes _____ No

Number Of Children in Household: _____ Under six years old: _____

Name	DOB	Tested for PB	Results
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____

Any Children with Special Needs (Handicapped)? _____

General Observation of Dwelling Unit:

Peeling Paint: Yes _____ No _____ Interior _____ Exterior _____
 Overall Upkeep of Interior: Good _____ Fair _____ Poor _____
 Housekeeping Practice: Good _____ Fair _____ Poor _____

CASE MANAGEMENT ASSESSMENT cont.

1. Does the child eat, chew, or suck on:

<input type="checkbox"/> Plaster	<input type="checkbox"/> Newspapers, comics, magazines	<input type="checkbox"/> Doors
<input type="checkbox"/> Paint Chips	<input type="checkbox"/> Dirt	<input type="checkbox"/> Moldings
<input type="checkbox"/> Toys	<input type="checkbox"/> Guard Rails	<input type="checkbox"/> Cigarette butts
<input type="checkbox"/> Metal Objects	<input type="checkbox"/> Matches	<input type="checkbox"/> Cigarette ashes
<input type="checkbox"/> Mini-blinds	<input type="checkbox"/> Window Sill	<input type="checkbox"/> Furniture(crib-bed)

2. Where does child sleep? _____

Is there chipping paint, broken plaster, peeling wallpaper or mini-blinds near the child's bed that can be easily reached or that can fall into the child's bed?

☐ Yes ☐ No; If yes, specify: _____

3. Does your child take painted metal or printed objects to bed with him/her?

☐ Yes ☐ No; If yes, specify: _____

4. Is there any area where the child is during the day or night where he/she could breathe car exhaust, other noticeable vapors, dust fumes or odors? I.e. (domestic trash burning, commercial, industrial exhaust fumes from stoves or fireplaces).

☐ Yes ☐ No; If yes, specify: _____

5. Does the child live with an adult whose job or hobby involves exposure to lead (examples: highway construction, smelting/refining, automotive repairs, pottery, etc.)?

☐ Yes ☐ No

6. What kind of pots, pans and dishes do you use? _____

I.e. (lead, soldered pots, pans, utensils, ceramics, pottery)

What do you store food in? Cans – pewter? _____

What kind of cup does your child drink from? _____

7. Do you have a garden? _____ Where located? _____

8. Is there loose paint on wall/ceilings where food is prepared, the child eats, or where the child plays?

☐ Yes ☐ No; If yes, specify: _____

9. Has this home had any renovations in the last 6 months? ☐ Yes ☐ No

Date referred to Environmental Health Specialist: _____

Case Managers Signature: _____

Re-Test Letter

Health Department Letterhead

Dear _____,

_____ was tested for lead poisoning on _____. The results of the blood test for lead, taken from the finger, was above normal. The finger stick is only a screening test and when the results are elevated we need to obtain blood from the vein in the arm for a more accurate lead level.

It is **VERY IMPORTANT** that you bring this child along with this letter to the (Your Health Department Name) **ANY** (Your Health Department Testing Hours) before _____.

Make sure your child has a good meal and lots of liquid to drink before the test as this makes it easier to draw the blood. **YOU MUST BRING THE CHILD'S MEDICAID/HMO CARD WITH YOU.**

If you have any questions or if this time is not convenient, please call (Health Department Phone Number).

THIS IS A LAB ONLY APPOINTMENT

Sincerely,

(Name of Lead Outreach Worker)

Lead Outreach Worker

(Name of Senior Lead Nurse)

Senior Lead Nurse

Follow-up Letter

Health Department Letterhead

Dear _____,

It is time for _____ to have a follow-up lead test. It is **VERY IMPORTANT** that you bring this child along with this letter to the (Your Health Department Name) by _____. Please come to the lab any (Testing Days) between (Your Health Department Testing Hours).

Make sure your child has a good meal and lots of liquids to drink before the test as this makes it easier to draw the blood. **YOU MUST BRING THE CHILD'S MEDICAID/HMO CARD WITH YOU.**

If you have any questions or if this time is not convenient, please call (Your Health Department Phone Number).

THIS IS A LAB ONLY APPOINTMENT.

Sincerely,

(Name of Lead Outreach Worker)
Lead Outreach Worker

(Name of Senior Lead Nurse)
Senior Lead Nurse

Virginia Health Districts

Arlington Health District
1800 N. Edison St.
Arlington, VA 22207
(703) 228-4992/ (703) 228-5233 (fax)

Alexandria Health District
517 N. Asaph St.
Alexandria, VA 22314
(703) 838-4400/ (703) 838-4038 (fax)

Alleghany Health District
P.O. Box 220
Academy St.
Fincastle, VA 24090
(540) 473-8240/ (540) 473-8242 (fax)

Central Shenandoah Health District
P.O. Box 2126
1414 N. Augusta St.
Staunton, VA 24402-2126
(540) 332-7830/ (540) 885-0149 (fax)

Central Virginia Health District
P.O. Box 6056
1900 Thompson Drive
Lynchburg, VA 24501
(804) 799-5190/ (804) 799-5022 (fax)

Chesapeake Health District
748 Battlefield Blvd., North
Chesapeake, VA 23320
(757) 382-8600/ (757) 547-0298

Chesterfield Health District
P.O. Box 100
9501 Lucy Corr Drive
Chesterfield, VA 23832
(804) 748-1691/ (804) 751-4497 (fax)

Crater Health District
P.O. Box 2081
301 Halifax St.
Petersburg, VA 23804
(804) 863-1652/ (804) 862-6126 (fax)

Cumberland Plateau Health District
P.O. Box 2347
155 Combs St.
Lebanon, VA 24266
(540) 889-7621/ (540) 899-7625 (fax)

Eastern Shore Health District
P.O. Box 177
23191 Front St.
Accomac, VA 23301-0177
(757) 787-5880/ (757) 787-5481 (fax)

Fairfax Health District
10777 Main St, Suite 203
Fairfax, VA 22030
(703) 246-2411/ (703) 273-0825 (fax)

Hampton Health District
3130 Victoria Boulevard
Hampton, VA 23661-1588
(757) 727-1172/ (757) 727-1185 (fax)

Hanover Health District
12312 Washington Highway
Ashland, VA 23005
(804) 752-4313/ (804) 752-4355 (fax)

Henrico Health District
Govt. Center/Human Services Bldg.
8600 Dixon Powers Dr.
Richmond, VA 23228
(804) 501-4622/ (804) 501-4983 (fax)

Lenowisco Health District
134 Roberts St, SW
Wise, VA 24293
(540) 328-8000/ (540) 376-1020 (fax)

Lord Fairfax Health District
P.O. Box 2056
150 Commercial St.
Winchester, VA 22601
(540)722-3480/ (540)722-3479 (fax)

Loudoun Health District
1 Harrison St., SE
P.O. Box 7000
Leesburg, VA 20177
(703) 777-0234/ (703) 771-5023 (fax)

Mount Rogers Health District
201 Francis Marion Lane
Marion, VA 24354
(540) 782-9000/ (540) 783-8353 (fax)

New River Health District
210 S. Pepper St. Suite A
Christiansburg, VA 24073
(540) 381-7100/ (540) 381-7104

Norfolk City Health District
401 Colley Ave.
Norfolk, VA 23507
(757) 683-2796/ (757) 683-8878 (fax)

Peninsula Health District
416 J. Clyde Morris Blvd.
Newport News, VA 23601
(757) 594-7300/ (757) 594-7714 (fax)

Piedmont Health District
111 South St. First Floor
Farmville, VA 23901
(804) 392-3984/ (804) 392-1038 (fax)

Pittsylvania/Danville Health District
326 Taylor Drive
Danville, VA 24541
(804) 947-6777/ (804) 947-2338 (fax)

Portsmouth Health District
800 Crawford Parkway
Portsmouth, VA 23704
(757) 396-6821/ (757) 396-6822 (fax)

Prince William Health District
9301 Lee Ave.
Manassas, VA 22110
(703) 792-6300/ (703) 792-6338 (fax)

Rappahannock Health District
608 Jackson St.
Fredericksburg, VA 22401
(540) 899-4797/ (540) 899-4599 (fax)

Rappahannock/Rapidan Health District
640 Laurel St.
Culpeper, VA 22701-3993
(540) 829-7350/ (540) 829-7345 (fax)

Virginia Health Districts

Richmond City Health District

900 E. Marshall St. 3rd Floor
Richmond, VA 23219
(804) 698-3153/ (804) 698-3111 (fax)

Roanoke City Health District
515 Eighth St., SW
Roanoke, VA 24016
(540) 857-7600/ (540) 857-6987 (fax)

Southside Health District
Mary Bethune Office Complex
P.O. Box 845
Halifax, VA 24558
(804) 476-4863/ (804) 476-4869 (fax)

Thomas Jefferson Health District
P.O. Box 7546
Charlottesville, VA 22906
(804) 972-6219/ (804) 972-4310 (fax)

Three Rivers Health District
VSH 33
P.O. Box 415
Saluda, VA 23149
(804) 758-0029/ (804) 758-4828 (fax)

Virginia Beach Health District
Pembroke Corporate Center III
4452 Corporation Lane
Virginia Beach, VA 23462
(757) 518-2700/ (757) 518-2640 (fax)

Western Tidewater Health District
P.O. Box 1587
1217 N. Main St.
Suffolk, VA 23434
(757) 686-4900/ (757) 925-2243 (fax)

West Piedmont Health District
P.O. Box 1032
295 Commonwealth Blvd.
Martinsville, VA 24114
(540) 638-2311/ (540) 638-3537 (fax)

Epi-1 Form

MAIL THE TOP TWO COPIES TO YOUR LOCAL HEALTH DEPARTMENT

VIRGINIA DEPARTMENT OF HEALTH Confidential Morbidity Report

Patient's Name (Last, First, Middle Initial):				SSN: _____	
Patient's Address (Street, City or Town, State, Zip Code):				Home #: () _____	
				Work #: () _____	
City or County of Residence					
Date of Birth:	Age:	Race: <input type="checkbox"/> Asian/Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Other (specify):			Hispanic: <input type="checkbox"/> Yes <input type="checkbox"/> No
					Sex: <input type="checkbox"/> F <input type="checkbox"/> M
DISEASE OR CONDITION:				Case Status: <input type="checkbox"/> Confirmed <input type="checkbox"/> Suspected	
Date of Onset:					
Date of Diagnosis:	Death: <input type="checkbox"/> Yes <input type="checkbox"/> No Death Date:		Influenza: (Report # and type only. No patient identification). Number of Cases: Type, if known:		
Physician's Name:				Phone: ()	
Address:					
Hospital Admission? <input type="checkbox"/> Yes <input type="checkbox"/> No			Hospital Name:		
Date of Admission:			Chart ID No:		
Laboratory Information and Results					
Source of Specimen:				Date Collected:	
Laboratory Test:					
Results:					
Name/Address of Lab:					
CLIA Number:					
Other Information					
Comments: (E.g., Risk Situation [Food Handling, Patient Care, Day Care], Treatment [including dates], Immunization Status [including dates], Signs/Symptoms, Exposure, Outbreak Associated, etc.)					
For Health Department Use:				Date Received:	
Name, Address, and Phone Number of Person Completing This Form:				Date Reported:	
				Check here if you need more of these forms, or call your local health department. <input type="checkbox"/> (Be sure your address is complete.)	

Please complete as much of this form as possible.

Form Epi-1, 11/98

Directions for Completing Epi-1 Form

MAIL THE TOP TWO COPIES TO YOUR LOCAL HEALTH DEPARTMENT

Please report the following diseases (and any other disease or outbreak of public health importance) in the manner required by Section 32.1-36 of the Health Laws of Virginia and 12 VAC 5-90-80 of the Board of Health *Regulations for Disease Reporting and Control*. Enter as much information as possible on the reporting form.

Acquired immunodeficiency syndrome (AIDS)	Lyme disease
Amebiasis *	Lymphogranuloma venereum
ANTHRAX *	Malaria *
Arboviral infection*	MEASLES (Rubeola) *
BOTULISM *	MENINGOCOCCAL INFECTION *
Brucellosis *	Mumps *
<i>Campylobacter</i> infection *	Ophthalmia neonatorum
Chancroid *	OUTBREAKS, ALL (including foodborne,
Chickenpox	nosocomial, occupational, toxic substance-
<i>Chlamydia trachomatis</i> infection *	related, waterborne, and other outbreaks)
CHOLERA *	PERTUSSIS (Whooping cough) *
Cryptosporidiosis *	PLAGUE *
Cyclosporiasis *	POLIOMYELITIS *
DIPHTHERIA *	PSITTACOSIS
Ehrlichiosis	RABIES, HUMAN AND ANIMAL *
<i>Escherichia coli</i> O157:H7 and other	Rabies treatment, post-exposure
enterohemorrhagic <i>E. coli</i> infections *	Rocky Mountain spotted fever
Giardiasis *	Rubella (German measles), including congenital
Gonorrhea *	rubella syndrome *
Granuloma inguinale	Salmonellosis *
HAEMOPHILUS INFLUENZAE INFECTION,	Shigellosis*
INVASIVE *	Streptococcal disease, Group A, invasive *
Hantavirus pulmonary syndrome	Syphilis (report PRIMARY and SECONDARY
Hemolytic uremic syndrome (HUS)	syphilis by rapid means) *
Hepatitis, Acute Viral	Tetanus
HEPATITIS A *	Toxic shock syndrome
Hepatitis B *	Toxic substance related illnesses
Hepatitis C	Trichinosis *
Other Acute Viral Hepatitis	TUBERCULOSIS DISEASE (MYCOBACTERIA *~)
Human immunodeficiency virus (HIV) infection *	Tuberculosis infection in children age <4 years
Influenza * ¶	(Mantoux skin test reaction <input type="checkbox"/> 10 mm)
Kawasaki syndrome	Typhoid fever
Lead - elevated blood levels *‡	Typhus
Legionellosis *	Vancomycin-resistant <i>Staphylococcus aureus</i> *
Leprosy (Hansen disease)	<i>Vibrio</i> infection *
Listeriosis *	YELLOW FEVER

UPPER CASE indicates conditions that must be reported rapidly to the local health director via telecommunication. Report all other diseases within seven days of diagnosis.

*These conditions are reportable by directors of laboratories. These and all other conditions are reportable by physicians and directors of medical care facilities as well.

¶Physicians and directors of medical care facilities should report influenza by number of cases only (and type of influenza, if available).

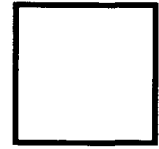
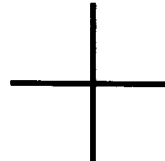
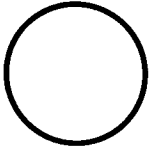
~AFB on smear, speciation, and drug susceptibility.

‡Venous blood lead level ☐ 10 ☐ g/dl in a child under age 16 years or ☐ 25 ☐ g/dl in a person 16 years of age or older.

Virginia Department of Health
Office of Epidemiology
P. O. Box 2448, Room 113
Richmond, Virginia 23218-2448

DIRECTIONS FOR ADMINISTRATION

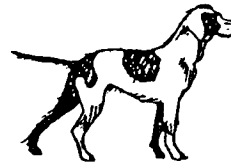
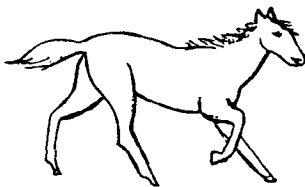
1. Try to get child to smile by smiling, talking or waving. Do not touch him/her.
2. Child must stare at hand several seconds.
3. Parent may help guide toothbrush and put toothpaste on brush.
4. Child does not have to be able to tie shoes or button/zip in the back.
5. Move yarn slowly in an arc from one side to the other, about 8" above child's face.
6. Pass if child grasps rattle when it is touched to the backs or tips of fingers.
7. Pass if child tries to see where yarn went. Yarn should be dropped quickly from sight from tester's hand without arm movement.
8. Child must transfer cube from hand to hand without help of body, mouth, or table.
9. Pass if child picks up raisin with any part of thumb and finger.
10. Line can vary only 30 degrees or less from tester's line. ✓
11. Make a fist with thumb pointing upward and wiggle only the thumb. Pass if child imitates and does not move any fingers other than the thumb.




12. Pass any enclosed form. Fail continuous round motions.
13. Which line is longer? (Not bigger.) Turn paper upside down and repeat. (pass 3 of 3 or 5 of 6)
14. Pass any lines crossing near midpoint.
15. Have child copy first. If failed, demonstrate.

When giving items 12, 14, and 15, do not name the forms. Do not demonstrate 12 and 14.

16. When scoring, each pair (2 arms, 2 legs, etc.) counts as one part.
17. Place one cube in cup and shake gently near child's ear, but out of sight. Repeat for other ear.
18. Point to picture and have child name it. (No credit is given for sounds only.)
If less than 4 pictures are named correctly, have child point to picture as each is named by tester.



19. Using doll, tell child: Show me the nose, eyes, ears, mouth, hands, feet, tummy, hair. Pass 6 of 8.
20. Using pictures, ask child: Which one flies?... says meow?... talks?... barks?... gallops? Pass 2 of 5, 4 of 5.
21. Ask child: What do you do when you are cold?... tired?... hungry? Pass 2 of 3, 3 of 3.
22. Ask child: What do you do with a cup? What is a chair used for? What is a pencil used for?
Action words must be included in answers.
23. Pass if child correctly places and says how many blocks are on paper. (1, 5).
24. Tell child: Put block **on** table; **under** table; **in front of** me, **behind** me. Pass 4 of 4.
(Do not help child by pointing, moving head or eyes.)
25. Ask child: What is a ball?... lake?... desk?... house?... banana?... curtain?... fence?... ceiling? Pass if defined in terms of use, shape, what it is made of, or general category (such as banana is fruit, not just yellow). Pass 5 of 8, 7 of 8.
26. Ask child: If a horse is big, a mouse is ___? If fire is hot, ice is ___? If the sun shines during the day, the moon shines during the ___? Pass 2 of 3.
27. Child may use wall or rail only, not person. May not crawl.
28. Child must throw ball overhand 3 feet to within arm's reach of tester.
29. Child must perform standing broad jump over width of test sheet (8 1/2 inches).
30. Tell child to walk forward,  heel within 1 inch of toe. Tester may demonstrate.
Child must walk 4 consecutive steps.
31. In the second year, half of normal children are non-compliant.

OBSERVATIONS: